Four new species of ironbark (*Eucalyptus* L.Hérit., Myrtaceae) from southern Queensland

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Summary

Bean, A.R. & Brooker, M.I.H. (1994). Four new species of ironbark (*Eucalyptus* L.Hérit., Myrtaceae) from southern Queensland. *Austrobaileya* 4(2): 187–194. *Eucalyptus rhombica*, *E. tholiformis*, *E. taurina* and *E. corynodes* are all newly described. All are endemic to southern Queensland. Each species is illustrated and compared with related species, and its distribution mapped. A key to the ironbarks of southern Queensland is provided.

Keywords: Myrtaceae; *Eucalyptus* - southern Queensland; *Eucalyptus rhombica*; *Eucalyptus tholiformis*; *Eucalyptus taurina*; *Eucalyptus corynodes*.

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Introduction

The ironbarks are probably the most easily recognised group of eucalypts because of their characteristic dark, deeply furrowed, hard or rarely flaky, rough bark. Ironbarks occur from the Kimberley of Western Australia and the 'Top End' of the Northern Territory (a single species *E. jensenii*), throughout eastern Queensland and New South Wales, to central and eastern Victoria.

The ironbarks belong to three taxonomic series, *E.* series *Siderophloiae* Blakely (about 20 formally described species), *E.* series *Rhodoxyla* (Blakely) Chippendale (about 15 formally described species) and *E.* series *Melliodorae* Blakely (2 formally described species). For field identification a useful, but purely arbitrary, grouping of ironbarks is into fully rough-barked and gum-topped ironbarks. Most ironbarks of the *Rhodoxyla* and *Melliodorae* series are gum-topped, while several of the *Siderophloiae* series are likewise. In this paper, we publish names for four new gum-topped ironbark species; three belonging to series *Siderophloiae* and one to series *Rhodoxyla*. In the alternative informal classification of Pryor and Johnson (1971), the species fall into series *Pruinosae* and series *Paniculatae* respectively. Nomenclature of stigma types follows Boland and Sedgley (1986).

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Taxonomy

Eucalyptus ser. Siderophloiae Blakely, Key Eucalypts 59, 246 (1934). **Type:** *E. siderophloia* Benth.

Eucalyptus rhombica A.R. Bean & Brooker sp. nov. ad *E.* seriem *Siderophloias* pertinens, ramulis laevibus, foliis juvenilibus lanceolatis, absentia staminodiorum, alabastris rhomboideis et fructibus magnis (ad 10 mm longis) distinguitur. **Typus:** Queensland. BURNETT DISTRICT: Hungry Hills State Forest, east of Ceratodus, (25°19'S, 151°25'E), 07 September 1989, *A.R. Bean* 1109 & *P.I. Forster* (holo: BRI; iso: CANB, MEL,NSW).

Tree to 21 m tall with dark grey, somewhat flaky ironbark on the trunk and larger branches; branches less than 12 cm diameter smooth-barked. Cotyledons reniform. Seedling leaves shortly petiolate, lanceolate to broadly lanceolate, up to 8 × 3 cm, dull blue-green above, purplish below, opposite for 4–5 pairs. Juvenile leaves petiolate, lanceolate, to 15 × 3 cm, slightly discolorous, bluish, not glaucous, alternate, base cuneate; adult leaves petiolate, narrow-lanceolate, 10–14.5 × 1.5–2 cm, concolorous, dull grey-green, alternate; venation densely reticulate, oil glands obscure, discrete within the areoles. Inflorescences simple and

axillary, or apparently compound and terminal; umbellasters 7-flowered; peduncles terete, to 20 mm long; pedicels 3–5 mm long. Buds rhomboidal, 11–14 × 5–6 mm, outer operculum shed early leaving permanent ring scar; inner operculum conical to rostrate, up to 7 × 6 mm; stamens white, mostly flexed, all fertile. Stigma blunt. Fruiting pedicels angular, with ridges sometimes extending on to fruit itself; fruits hemispherical to cylindrical, 8–10 × 8–10 mm; disc broad and descending; valves (3)4 or 5, enclosed or at rim level. Ovules in 4 vertical rows on each placenta. Seeds dark brown, reticulate dorsally, not angular, lacunose; hilum ventral. **Fig. 1 A–B.**

***Specimens examined*: Queensland.** LEICHHARDT DISTRICT: c. 40 km west of Taroom, Sep 1979, *Boyland* 8041 (BRI,CANB). BURNETT DISTRICT: quarry beside Gurgeena road, 6.8 km from Burnett highway, Sep 1988, *Bean* 924 (BRI); southern end of Binjour plateau, Nov 1987, *Bean* 687 (BRI,CANB). DARLING DOWNS DISTRICT: 5.5 km from Washpool Creek crossing on the Karara-Toowoomba road on the road to Milmerran, Sep 1988, *Briggs & Keith* 2403 (BRI,CANB); northern boundary of Western Creek SF, c. 30 km NW of Milmerran, Mar 1988, *Keith* 11 (BRI,CANB, NSW); 12.5 km from Karara towards Milmerran, Nov 1989, *Bean* 1175 (BRI,NSW); on Karara-Milmerran road, 12 km from Karara, Jun 1990, *Brooker* 10525 (AD,BRI,CANB, MEL,NSW).

***Distribution and habitat*:** *E. rhombica is* known from a few sites over a total range of about 400 kilometres, from west of Warwick to north east of Eidsvold and west of Taroom (**Fig. 2**). Soils vary from deep to very shallow yellow to brown sands, and topography may be gentle or very hilly. Associated species include *E. fibrosa* F. Muell. subsp. *fibrosa*, *E. apothalassica* L.A.S. Johnson & K.D. Hill, *E. virens* Brooker & A.R. Bean, *E. trachyphloia* F. Muell. and *E. tenuipes* (Maiden & Blakely) Blakely & C.T. White.

***Flowering period*:** Flowers have been collected in March, September and November.

***Conservation status*:** A coding of 3RC is appropriate according to the criteria of Briggs and Leigh (1988). All known populations are small and isolated. Part of the population at the type locality is protected as a Scientific Area.

***Affinities*:** While *E. rhombica* belongs to *E.* series *Siderophloiae*, it has no very close relatives. It is similar to *E. fibrosa* subsp. *fibrosa*, with which it sometimes grows, but *E. rhombica* is easily distinguished by its mostly flexed stamens (outer stamens erect in *E. fibrosa* subsp. *fibrosa*, fruits 8–10 × 8–10mm (7–9 × 6–8 mm in *E. fibrosa* subsp. *fibrosa*) and lanceolate juvenile leaves (orbicular in *E. fibrosa* subsp. *fibrosa*). In the herbarium, *E. rhombica* resembles *E. sideroxylon* A. Cunn. ex Woolls because of its similar shaped leaves and fruits, but *E. rhombica* can be distinguished by its grey, rather flaky ironbark, early-shedding outer operculum and lack of staminodes. *E. rhombica* has larger fruits than almost all other ironbark species; only *E. quadricostata* Brooker and *E. tricarpa* (L.A.S. Johnson) L.A.S. Johnson & K.D. Hill have consistently larger fruits.

***Etymology*:** From the Latin, rhombicus, referring to the shape of the buds.

Eucalyptus tholiformis A.R. Bean & Brooker **sp. nov.** ad *E.* seriem *Siderophloias* pertinens, ramulis laevibus, foliis juvenilibus late-ovatis, absentia staminodiorum et fructibus disco lato ascendenti distinguitur. **Typus:** Queensland. DISTRICT: Salvator Rosa N.P., on ridge east of the Sentinel, 18 May 1986, *A.R. Bean* 444 (holo: BRI; iso: BRI,MEL).

Tree to 15 m high, with hard dark grey to black, deeply furrowed ironbark persistent on the trunk and larger branches; branches up to 10 cm diameter with smooth, white bark. Cotyledons and seedling leaves not seen. Juvenile leaves petiolate, ovate, 4.5–8 × 2–3.5 cm, concolorous, bluish, somewhat glaucous, alternate, base cuneate. Adult leaves with petioles 13–24 mm long, lanceolate to narrow-lanceolate, 7.5–11.5 × 1.5–3 cm, concolorous, dull blue-grey to grey-green, alternate; reticulation very dense, regular, leaves apparently glandless. Inflorescences apparently compound and terminal; umbellasters 7-flowered; peduncles flattened, 6–14 mm long; pedicels absent or up to 3 mm long; buds fusiform, 7–8 × 2–3.5 mm, outer operculum shed early leaving permanent ring scar, inner operculum conical with a rounded apex, 3–4 × 2–3.5 mm; stamens white, flexed. Stigma blunt to slightly pinhead. Fruiting pedicels 0–4 mm long, fruits obconical to

cylindrical, current-season fruit 5–6 × 5–5.5 mm, older fruit up to 7 × 6 mm, disc broad, convex; valves 4 or 5, exserted. Seeds brown, reticulate dorsally, not angular; hilum ventral. **Fig. 1 C–E.**

***Specimens examined*: Queensland.** LEICHHARDT DISTRICT: Corries Bluff, Salvator Rosa National Park, May 1986, *Bean* 447 (BRI,CANB); 16.9 km east of Mantuan Downs T/O on Springsure-Tambo road, Sep 1990, *Bean* 2230 (BRI,CANB); The Sentinel, west shoulder, Oct 1987, *Brooker* 9775, 9776 (BRI,CANB); 86 km from Springsure towards Tambo, Mar 1990, *Brooker* 10444 (BRI,CANB, MEL,NSW,QRS); Salvator Rosa National Park, Apr 1974, *Stanton* 13 (CANB); slopes of Pythagoras Mtn, Salvator Rosa NP, May 1986, *Bean* 446 (BRI).

***Distribution and habitat*:** *E. tholiformis* has a quite small geographical range in the area to the west of Springsure (**Fig. 2**). It grows on sandstone hillsides in shallow sandy soils, and associated eucalypt species include *E. trachyphloia*, *E. cloeziana* F. Muell. and *E. leichhardtii* F.M. Bailey.

***Flowering period*:** Unknown.

***Conservation status*:** The species is common in some parts of Salvator Rosa N.P. and populations outside the national park are not under any immediate threat.

***Affinities*:** *E. tholiformis* appears to be most closely related to *E. fibrosa*, but is easily distinguished by its smooth bark on branches up to 10 cm diameter (up to 5 cm diameter in *E. fibrosa*), ovate juvenile leaves up to 8 × 3.5 cm (orbicular and up to 15 × 15 cm in *E. fibrosa*), operculum about the same length as the hypanthium (operculum more than double length of hypanthium in *E. fibrosa*) and fruits to 7 × 6 mm with a steeply convex disc (up to 9 × 8 mm and disc level to slightly ascending in *E. fibrosa*).

***Etymology*:** From the Latin, *tholiformis* - dome-shaped, referring to the domed disc of the fruit.

Eucalyptus taurina A.R. Bean & Brooker **sp. nov.** ad *E.* seriem *Siderophloias* pertinens, ramulis laevibus, foliis juvenilibus lanceolatis, absentia staminum, alabastris fusiformibus et fructibus sessilibus valvis exsertis distinguitur. **Typus:** Queensland. MORETON DISTRICT: 7.5 km north-east of Helidon, 17 Oct 1990, *A.R. Bean* 2514 (holo: BRI; iso: CANB,K,MEL,NSW).

Tree to 22 m high with rugged grey ironbark on the trunk and larger branches, branches less than 8 cm diameter smooth. Cotyledons and seedling leaves not seen. Juvenile leaves with petioles 4–7 mm long, lanceolate, 9–13.5 × 1.5–2.5 cm, strongly discolorous, not glossy, alternate. Adult leaves with petioles 14–18 mm long, lanceolate to narrowly-lanceolate or slightly falcate, 9.5–15 × 1.5–2.5 cm, concolorous, dull, grey-green, alternate; venation densely reticulate; oil glands obscure. Inflorescences axillary in upper leaf axils or apparently compound and terminal; umbellasters 7-flowered or less by abortion; peduncles angular, 4–7 mm long; pedicels absent or up to 2 mm long; buds fusiform when young, becoming elliptical at maturity, 7–8 × 3–3.5 mm; operculum scar present, inner operculum obtuse, to 4 × 3.5 mm; stamens white, inflexed; stigma pinhead type. Fruits sessile or shortly pedicellate, 5–6.5 × 5–6 mm, obconical; disc obscure; valves 3–5, exserted. Seeds dark brown, reticulate dorsally, not angular, not lacunose; hilum ventral. **Fig. 1 F–G.**

***Specimens examined*: Queensland.** MORETON DISTRICT: Davids road, Helidon Hills, NNE of Helidon, Mar 1990, *Bean* 1387 (BRI,CANB, NSW); Crows Nest National Park, Oct 1987, *Brooker* 9797 (BRI,CANB); 10 km NW of Gatton, Oct 1990, *Bean* 2511 & Cummings (BRI,CANB).

***Distribution and habitat*:** *E. taurina* occurs in two small disjunct areas of south-eastern Queensland; north and north-east of Helidon, and east of Crows Nest (**Fig. 2**). It grows on ridges in shallow sandy soil derived from granite or sandstone. The main associated tree species are *Eucalyptus gummifera* (Sol. ex Gaertn.) Hochr., *E. trachyphloia*, *E. baileyana* F. Muell., *E. dura* L.A.S. Johnson & K.D. Hill, *E. acmenoides* Schauer, *E. henryi* S.T. Blake and *Angophora woodsiana* F.M. Bailey.

***Flowering period*:** Flowers have been collected in October.

***Conservation status*:** A coding of 2RC is appropriate according to the criteria of Briggs and Leigh (1988). The species is conserved in Crows Nest Falls N.P., but the known population there is small. The population near Helidon is much larger but it is not conserved there.

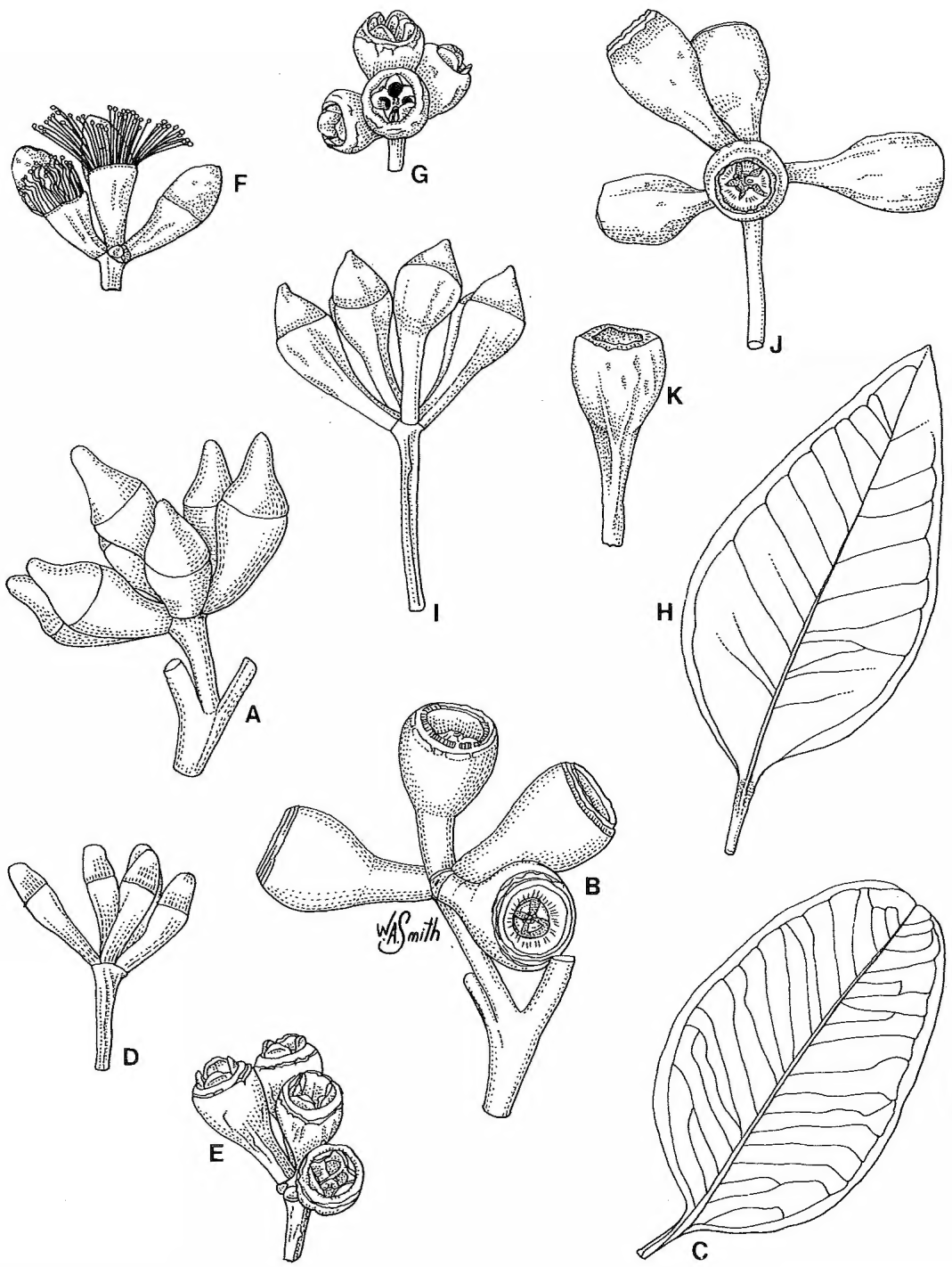

Fig. 1. *Eucalyptus* spp.: A,B. *E. rhombica*. A. buds × 1.5. B. fruits × 1.5. C–E. *E. tholiformis*. C. juvenile leaf × 1. D. buds × 2. E. fruits ×2. F–G. *E. taurina*. F. buds× 2 . G. fruits × 2. H–K. *E. corynodes*. H. juvenile leaf × 1. I. buds × 2. J, K. fruits × 2. A, Briggs & Keith 2403; B, Bean 924; C, Ballingall 2181; D, Bean 447; E, Bean 446; F, Bean 2511; G, Bean 1387; H, Bean 2278; I, Brooker 10479 & Kleinig; J, K, Bean 2284.

Affinities: *E. taurina* is superficially similar to *E. crebra* F. Muell., from which it differs by its smooth outer branches, fusiform buds and the sessile or almost sessile fruits with exserted valves. *E. taurina* differs from *E. tholiformis* by its narrow juvenile leaves (9–13.5 × 1.5–2.5 cm for *E. taurina*; 4.5–8 × 2–3.5 cm for *E. tholiformis*) and obscure fruiting disc.

Etymology: From the Latin, *taurinus* - of bulls, alluding to an encounter had by the first author when he first saw this species.

Eucalyptus ser. **Rhodoxyla** (Blakely) Chippendale, Fl. Australia 19: 504 (1988). Type: *E. paniculata* Sm.

Eucalyptus corynodes A.R. Bean & Brooker **sp. nov.** *Eucalypto durae* affinis a qua pedicellis et fructibus generaliter brevioribus, foliis latioribus et foliis semper hebetatis glaucis differt. **Typus:** Queensland. LEICHHARDT DISTRICT: 4.5 km south of Fairyland gate, S of Cracow, 12 June 1990, *M.I.H. Brooker* 10479 & *D.A. Kleinig* (holo: BRI; iso: AD,CANB, MEL,NSW).

Tree to 20 m high. Bark dark grey to black ironbark, deeply furrowed, sometimes fragmenting, persistent on trunk and large branches; branches less than 5 cm diameter smooth. Cotyledons elliptical. Seedling leaves with petioles 7–10 mm long, lanceolate to broadly lanceolate, 9–12.5 × 1.5–4 cm, discolorous, opposite for about 5 pairs, then alternate. Juvenile leaves petiolate, broadly lanceolate or ovate, up to 9.5 × 5.5 cm, blue-grey, glaucous, alternate. Adult leaves with petioles 15–23 mm long, lanceolate to narrowly-lanceolate, 8.5–14.5 × 1.5–3 cm, concolorous, dull grey-green, alternate; venation densely reticulate, leaves apparently glandless. Inflorescences apparently compound and terminal; umbellasters 7-flowered; peduncles flattened, 8–17 mm long; pedicels angular at least when dried, 4–6 mm long. Buds rhomboidal, 8–9 × 4–5 mm; operculum scar present, inner operculum conical to hemispherical, up to 5 × 5 mm. Flowers not seen. Fruits pedicellate, hemispherical to ovoid-truncate, 6–8 × 5–7 mm; staminophore prominent; valves 4–5, deeply enclosed. Seeds dark brown, reticulate dorsally, lacunose; hilum ventral. **Fig. 1 H–J.**

Specimens examined: **Queensland.** LEICHHARDT DISTRICT: about 4 km S of 'Fairyland', on Cracow-Taroom road, May 1985, *Bean* 182 (BRI,NSW); 4.8 km south of Downfall Creek, south of Cracow, May 1985, *Brooker* 9008 & *Bean* (BRI,CANB); Nathan Gorge, about 1 km NE of campsite, Oct 1989, *Bean* 1132 (BRI); ridge beside Cracow-Taroom road, 24.3 km from Cracow, Aug 1987, *Bean* 652 (BRI); seedling raised from *Bean* 652, seed from 24.3 km S of Cracow, Apr 1990, *Bean* 1478 (BRI,CANB). BURNETT DISTRICT: 'Melrose', 15 km west of Eidsvold, *Bean* 2284 (BRI,CANB,MEL,NSW).

Distribution and habitat: *E. corynodes is* known from three areas of south-eastern Queensland; Nathan Gorge, Cracow-Taroom road and west of Eidsvold (**Fig. 2**). It grows on sandstone or granite ridges with little soil development. Associated species include *Eucalyptus tenuipes*, *E. watsoniana* F. Muell. subsp. *watsoniana*, *E. baileyana*, *E. cloeziana*, *E. pachycalyx* Maiden & Blakely, *Casuarina inophloia* F. Muell. & F.M. Bailey and *Acacia bancroftii* Maiden.

Flowering period: June–August.

Conservation status: A coding of 2R is appropriate according to the criteria of Briggs and Leigh (1988). None of the three populations is conserved and each population appears to be quite small.

Affinities: *E. corynodes* is closely related to *E. dura*, differing from that by its dull, somewhat glaucous foliage at all stages of growth (green and somewhat glossy in *E. dura*), juvenile leaves up to 5.5 cm wide (to 4.5 cm wide in *E. dura*), pedicels 4–6 mm long (5–10 mm long in *E. dura*) and fruits 6–8 mm long (7–10 mm long in *E. dura*). The two species are allopatric with *E. dura* occurring to the south and east of *E. corynodes*. **Fig. 2.**

Etymology: From the Greek, *corynodes* - club-shaped, alluding to the buds.

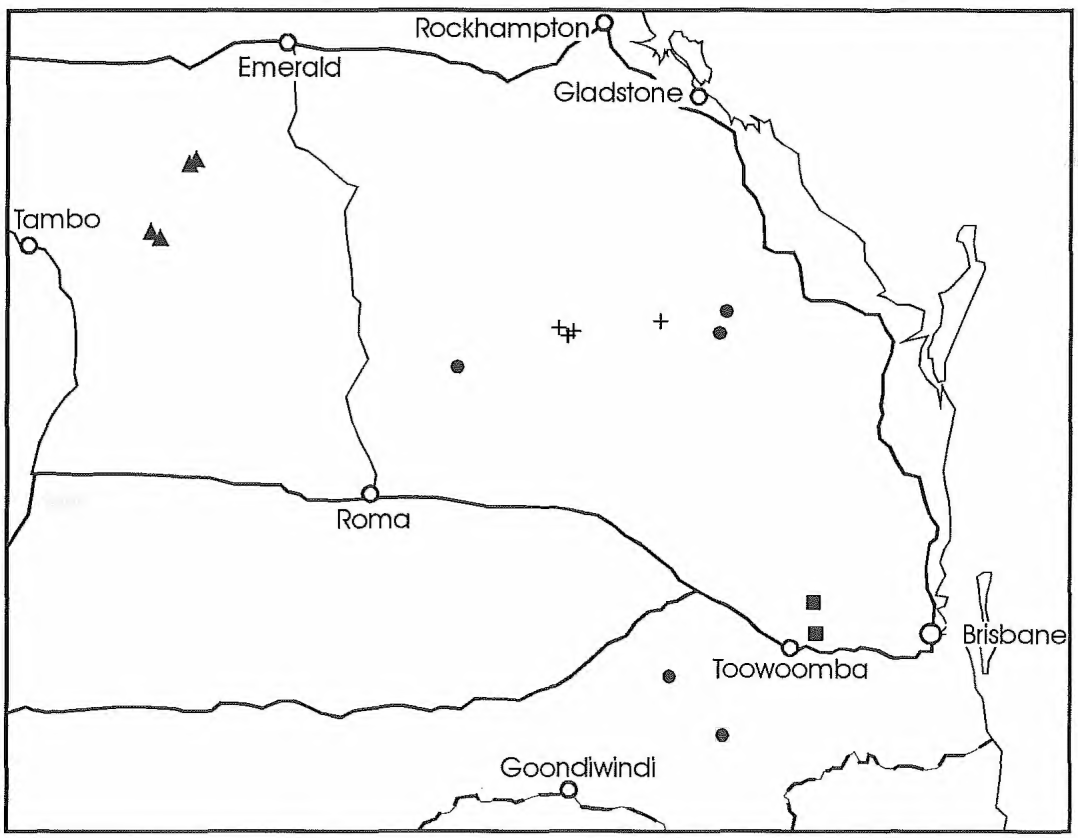

Fig. 2. Distribution of *Eucalyptus* spp. ● *E. rhombica*; ▲ *E. tholiformis*; ■ *E. taurina*; + *E. corynodes*.

Key to the ironbarks of southern Queensland (south of the Tropic of Capricorn)

Note: Although *E. drepanophylla* F. Muell. is listed in Flora of Australia (Chippendale 1988) as occurring in southern Queensland, the current authors believe that the southern records have resulted from misidentifications of other species, chiefly *E. siderophloia* Benth.

1. Branches >2cm diameter rough-barked 2
   Branches 2–5cm (up to 20 cm) diameter smooth-barked 6

2. Crown comprising sessile, opposite leaves ..... **E. melanophloia**
   Crown with alternate, petiolate leaves 3

3. Fruits hemispherical, with 4–6 valves 4
   Fruits obconical, with 3–4 valves 5

4. Leaves glossy; fruits 4–5 mm across ..... **E. virens**
   Leaves dull; fruits 5–6 mm across ..... **E. panda**

5. Leaves narrow-lanceolate; fruits 4–6 mm long ..... **E. crebra**
   Leaves lanceolate; fruits 6–8 mm long ..... **E. siderophloia**

6. Fruits with staminophore; staminodes present 7
   Fruits without staminophore; all stamens fertile 14

7. Buds without operculum scar ..... **E. sideroxylon**
   Buds with operculum scar 8

8. Adult leaves discolorous ..... **E. decolor**
   Adult leaves concolorous 9

9. Adult leaves ovate, 2–3 times longer than wide ..... **E. caleyi**
   Adult leaves lanceolate, 4–8 times longer than wide 10

10. Seedling leaves linear ..... **E. suffulgens**
    Seedling leaves ovate to lanceolate 11

11. Adult leaves dull ..... **E. corynodes**
    Adult leaves glossy 12

12. Fruits 7–10 mm long ..... **E. dura**
    Fruits 4–7 mm long 13

13. Leaves 1.5–2.8 cm wide; fruits 5–7 mm long ..... **E. melanoleuca**
    Leaves 0.6–1.6 cm wide; fruits 4–5 mm long ..... **E. sicilifolia**

14. Valves of fruit distinctly exserted 15
    Valves of fruit enclosed or at rim level 19

15. Juvenile leaves ovate to orbicular 16
    Juvenile leaves linear to lanceolate 18

16. Operculum >2 times length of hypanthium 17
    Operculum about same length as hypanthium ..... **E. tholiformis**

17. Buds and leaves glaucous ..... **E. fibrosa** subsp. **nubila**
    Buds and leaves not glaucous ..... **E. fibrosa** subsp. **fibrosa**

18. Fruits 3–5 mm wide ..... **E. beaniana**
    Fruits 5–6 mm wide ..... **E. taurina**

19. Branches 6–12 cm diameter smooth-barked 20
    Branches >6 cm diameter rough barked ..... **E. siderophloia**

20. Buds 11–14 mm long; fruits 8–10 mm long ..... **E. rhombica**
    Buds 6–8 mm long; fruits 4–7 mm long ..... **E. decorticans**

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